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| 09/896,374      | 06/28/2001  | Dimitris Achlioptas  | MS1-699US           | 9553             |

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EXAMINER

ZHEN, WEI Y

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2122

3

DATE MAILED: 07/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

*[Handwritten signature]*

## Office Action Summary

Application No.

09/896,374

Applicant(s)

ACHLIOPTAS ET AL. 

Examiner

Wei Y Zhen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-78 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-78 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. This office action is in response to the application filed on 6/28/2001.
2. Claims 1-78 are pending.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1- 78 are rejected under 35 U.S.C. 103(a) as being unpatentable over unpatentable over Kita et al, U.S. Patent No. 6,038,378 in view of applicant's admission of prior arts.

As per claim 1, Kita et al discloses modeling software using a software model that describes behavior associated with the software (col. 3 lines 13-24); and operating on the software model using an algorithm and at least one other different algorithm to produce a sequence of test actions (col. 3 lines 25-35).

Kita does not explicitly discloses the algorithm to be a random destination algorithm and the random destination algorithm being configured to randomly select a destination in the model and move to that destination to produce the sequence of test actions.

However, in the background section of the present application, applicant admits that be a random destination algorithm was well known in the art at the time the invention was made (p. 5-10 of the specification). Therefore, it would have been obvious to one having ordinary skill in the

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art to incorporate the well known knowledge into the teaching of Kita et al to the algorithm to be a random destination algorithm and the random destination algorithm being configured to randomly select a destination in the model and move to that destination to produce the sequence of test actions because doing so provides an efficient method to test the software with various methods according to various requirement to evaluate the performance of the software thoroughly.

As per claim 2, Kita discloses a state graph having multiple nodes individual ones of which representing a state, and links between the nodes that represent actions (Fig. 2).

As per claim 3, the rejection of claim 2 is incorporated and further Kita discloses using an algorithm to select a destination node, independent of a present node, and traverse state space to arrive at the destination node (col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21). Kita does not explicitly disclose using the random destination algorithm. However, in the background section of the present application, applicant admits that be a random destination algorithm was well known in the art at the time the invention was made (p. 5-10 of the specification).

Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the well known knowledge into the teaching of Kita et al to the algorithm to be a random destination because doing so provides an efficient method to test the software with various methods according to various requirement to evaluate the performance of the software thoroughly.

As per claim 4, the rejection of claim 2 is incorporated and further Kita discloses using an algorithm to select a destination node, independent of any previously-traversed nodes, and traverse state space to arrive at the destination node (col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21). Kita does not explicitly disclose using the random destination algorithm. However,

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in the background section of the present application, applicant admits that be a random destination algorithm was well known in the art at the time the invention was made (p. 5-10 of the specification). Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the well known knowledge into the teaching of Kita et al to the algorithm to be a random destination because doing so provides an efficient method to test the software with various methods according to various requirement to evaluate the performance of the software thoroughly.

As per claim 5, the rejection of claim 2 is incorporated and further Kita discloses using an algorithm to select a destination node, independent of a nearest neighbor node, and traverse state space to arrive at the destination node (col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21). Kita does not explicitly disclose using the random destination algorithm. However, in the background section of the present application, applicant admits that be a random destination algorithm was well known in the art at the time the invention was made (p. 5-10 of the specification). Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the well known knowledge into the teaching of Kita et al to the algorithm to be a random destination because doing so provides an efficient method to test the software with various methods according to various requirement to evaluate the performance of the software thoroughly.

As per claim 6, the combination of Kita and applicant's admitted prior arts discloses the software model comprises clusters of related nodes, and said operating comprises using the

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random destination algorithm to select, at random, at least one cluster of nodes (Kita, col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

As per claim 7, the combination of Kita and applicant's admitted prior arts discloses the software model comprises clusters of related nodes, and said operating comprises using the random destination algorithm to select, at random, at least one node inside at least one cluster of nodes (Kita, col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

Claim 8 is rejected for the reason set forth in the rejections of claims 1-5.

Claim 9 is rejected for the reason set forth in the rejections of claim 1.

Claim 10 is rejected for the reason set forth in the rejections of claim 2.

As per claims 11-15, Kita does not explicitly said multiple other algorithms comprise a random walk algorithm, a Chinese postman algorithm, a Markov chain algorithm and a anti-random walk algorithm. However, in the background section of the present application, applicant admits that various types of algorithm such as a random walk algorithm, a Chinese postman algorithm, a Markov chain algorithm and a anti-random walk algorithm were well known in the art at the time the invention was made (p. 5-10 of the specification). Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the well known knowledge into the teaching of Kita et al to have the algorithm to be one of the well known algorithm because doing so provides an efficient method to test the software with various methods according to various requirement to evaluate the performance of the software thoroughly.

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Claim 16 is rejected for the reason set forth in the rejections of claims 9-15.

Claim 17 is rejected for the reason set forth in the rejections of claims 1-2.

Claim 18 is rejected for the reason set forth in the rejections of claim 1.

Claim 19 is rejected for the reason set forth in the rejections of claim 11-14.

Claims 20 is rejected for the reason set forth in the rejections of claims 17-19.

Claim 21 is rejected for the reason set forth in the rejection of claim 17.

As per claim 22, kita discloses traversing a state graph using an algorithm to produce a sequence of test actions, the state graph having multiple nodes individual ones of which represent a state, and links between the nodes that represent actions (Fig. 2); and traversing the state graph using a second algorithm that is less deterministic than the first algorithm to produce a further sequence of test actions (col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

Kita does not explicitly disclose the algorithm is a deterministic first algorithm.

However, in the background section of the present application, applicant admits that various types of were well known in the art at the time the invention was made (p. 5-10 of the specification). Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the well known knowledge into the teaching of Kita et al to have the algorithm to be a deterministic first algorithm because doing so provides an efficient method to test the software with various methods according to various requirement to evaluate the performance of the software thoroughly.

As per claim 23, kita discloses traversing a state graph using an algorithm to produce a sequence of test actions, the state graph having multiple nodes individual ones of which represent a state, and links between the nodes that represent actions (Fig. 2); and traversing the

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state graph using a second algorithm that is less random than the first algorithm to produce a further sequence of test actions (col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

Kita does not explicitly disclose the algorithm is a random walk first algorithm.

However, in the background section of the present application, applicant admits that various types of were well known in the art at the time the invention was made (p. 5-10 of the specification). Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the well known knowledge into the teaching of Kita et al to have the algorithm to be a random walk first algorithm because doing so provides an efficient method to test the software with various methods according to various requirement to evaluate the performance of the software thoroughly.

Claim 24 is rejected for the reason set forth in the rejection of claim 1.

As per claim 25-27, Kita discloses wherein said changing comprises changing a way an algorithm interacts with the software model; wherein said changing comprises changing one or more properties associated with an algorithm; wherein said changing comprises selecting at least one different algorithm (col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

Claim 28 is rejected for the reason set forth in the rejection of claim 24.

Claims 29-30 are rejected for the reason set forth in the rejections of claims 9-11.

As per claim 31, Kita discloses said traversing using multiple steps comprises using a predetermined number of steps (col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

As per claim 32, Kita discloses said traversing using multiple steps comprises using a random number of steps (col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

Claim 33 is rejected for the reasons set forth in the rejections of claim 24.



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As per claim 34, Kita discloses said traversing using multiple steps comprises changing the number of steps on at least one iteration (col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

As per claim 35, Kita discloses said traversing using multiple steps comprises randomly changing the number of steps on at least one iteration (col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

As per claim 36, Kita discloses said traversing using multiple steps comprises changing the number of steps on at least one iteration in accordance with probabilistic characteristics (col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

Claim 37 is rejected for the similar reason set forth in the rejection of claim 28.

As per claims 38 and 39 (Kita, col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

As per claim 40 (Kita, col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

As per claim 41 (Kita, col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

As per claim 42 (Kita, col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

As per claim 43 (Kita, col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

As per claim 44 (Kita, col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

Claim 45 is rejected for the reason set forth in the rejections of claims 37 and 1.

As per claim 46, Kita does not explicitly disclose N and N1 are calculated using a Poisson distribution having multiple values each with an assigned probability of being selected. However, Official Notice is taken that Poisson distribution was well known at the time the invention was made. Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the teaching of the well known knowledge to have N and N1 be calculated

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using a Poisson distribution having multiple values each with an assigned probability of being selected because one would want to calculate N and N1 using the appropriate method to meet the needs of various types of systems.

As per claim 47 (Kita, col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

As per claim 48 (Kita, col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

As per claim 49 (Kita, col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

As per claim 50 (Kita, col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

As per claims 51-52, Kita does not explicitly disclose replacing one or more of the algorithms after a certain period of time or after the one or more algorithms have been used a certain number of times. However, Official Notice is taken that replacing testing algorithms after a certain period of time or after the one or more algorithms have been used a certain number of times were well known in the art at the time the invention was made. Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the teaching of the well known knowledge to replace testing algorithms after a certain period of time or after the one or more algorithms have been used a certain number of times because doing so ensures the testing algorithms is up to date and provides an efficient method to test the software more accurately and more thoroughly.

As per claims 53-54, Kita discloses representing software using a model that describes the software's behavior (Fig. 2); and operating upon the model using the selected one or more algorithms to produce a sequence of test actions (col. 3 lines 25-35 and col. 19 line 25 to col. 20

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line 21). Kita does not explicitly disclose the software having an associated social context; and selecting one or more algorithms to operate upon the model as a function of the software's social context, the social context is associated with a software developer who developed the software. However, Official Notice is taken that software having an associated social context; and selecting one or more algorithms to operate upon the model as a function of the software's social context and the social context is associated with the software developer were well known in the art at the time the invention was made. Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the teaching of the well known knowledge to have the software having an associated social context; and selecting one or more algorithms to operate upon the model as a function of the software's social context and the social context to be associated with the software developer because doing so ensures the testing algorithms is selected appropriately for different software and provides an efficient method to test the software more accurately and more thoroughly.

As per claim 55, Kita discloses changing the one or more algorithms; and operating upon the model using changed algorithms to produce an additional sequence of test actions (col. 3 lines 25-35 and col. 19 line 25 to col. 20 line 21).

Claim 56 is rejected for the same reason set forth in the rejection of claims 53-55.

Claim 57 is rejected for the same reason set forth in the rejection of claim 37.

Claim 58 is rejected for the same reason set forth in the rejection of claim 2.

Claim 59 is rejected for the reason set forth in the rejection of claim 17.

As per claims 60-61, Kita does not explicitly disclose wherein said defining comprises defining the clusters based on areas of connectivity within the state graph/based on the structure

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of the software. Official Notice is taken that defining the clusters based on areas of connectivity within the state graph/based on the structure of the software were well known in the art at the time the invention was made. Therefore, it would have been obvious to one having ordinary skill in the art to have defining the clusters based on areas of connectivity within the state graph/based on the structure of the software because doing so provides an efficient method to test the software more accurately and more thoroughly.

Claim 62 is rejected for the reason set forth in the rejection of claim 1.

Claim 63 is rejected for the reason set forth in the rejection of claim 11.

Claim 64 is rejected for the reason set forth in the rejection of claim 14.

Claim 65 is rejected for the reason set forth in the rejection of claim 22.

Claims 66-67 is rejected for the reason set forth in the rejection of claim 28.

Claim 68 is rejected for the reason set forth in the rejection of claim 11.

Claim 69 is rejected for the reason set forth in the rejection of claim 12.

Claims 70-72 is rejected for the reason set forth in the rejection of claims 13-15.

Claim 73 is rejected for the reason set forth in the rejection of claims 57-59.

Claims 74-75 are rejected for the reason set forth in the rejection of claims 15.

Claims 76-77 are rejected for the reason set forth in the rejection of claim 17.

Claim 78 is rejected for the reason set forth in the rejection of claims 17-18.

### *Conclusion*

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wei Y Zhen whose telephone number is (703) 305-0437. The examiner can normally be reached on Monday-Friday, 8 a.m. - 4:30 p.m..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Dam can be reached on (703) 305-4552. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Wei Zhen  
Primary Examiner  
7/16/2004